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REMARKS

Claims 1-3, 5-12, 14-21, 23-28, and 30-34 are pending. Claims 5-7, 14, 17, and 19-21 have been allowed, claims 4 and 29 have been cancelled, and claims 1-3, 8, 15, 16, 18, 23-28, 30, 32, and 33 have been amended.

Reconsideration of the application is respectfully requested for the following reasons.

In the Office Action, the Examiner indicated that claim 4 would be considered allowable if re-written into independent form to include all the features of its base and intervening claims. Analogously, claim 1 has been amended to recite the subject matter of claim 4 and claims 2, 3, and 8-12 have been amended to depend from claim 1. (The features of claims 2 and 3 added to claim 1 in Applicants' previous Amendment have been deleted in favor of making claims 2 and 3 depend from claim 1).

Claims 15, 16, 18, and 23 have been amended to depend from claim 14, which has been allowed.

Claims 24-28, 30, 32, and 33 have been re-written into independent form to recite the features of their base and intervening claims.


In view of the foregoing amendments, it is respectfully submitted that all the rejections in the Office Action have been overcome and thus should be withdrawn. It is further submitted that all presently pending claims are in condition for allowance. Favorable consideration and prompt allowance of the application is therefore respectfully requested.

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Should the Examiner believe that further amendments are necessary to place the application in condition for allowance, or if the Examiner believes that a personal interview would be advantageous in order to more expeditiously resolve any remaining issues, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with this application, including extension of time fees, to Deposit Account No.16-0607 (Attorney Docket No. K-078) and credit any excess fees to the same Deposit Account.

Respectfully submitted,



Daniel Y.J. Kim
Registration No. 36,186

Samuel W. Ntiros
Registration No. 39,318

FLESHNER & KIM, LLP
P.O. Box 221200
Chantilly, VA 20153-1200
Telephone No: (703) 502-9440
Facsimile No: (703) 502-9596

Marked-Up Version of the Amended Claims

1. (Twice Amended) A communication system which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or base station comprising:

a medium access control sub-layer;

upper layers of said medium access control sub-layer; and

a lower layer of said medium access control sub-layer,

wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or lower layer in response to requests therefrom, and wherein said medium access control sub-layer includes a common control channel group and a dedicated control channel group which have logical-type channels

[wherein said basic functions include at least one of a random access control information transfer function, a control information transfer function, a user information transfer function, framing/deframing functions, segmentation/reassembly functions, functions of dividing a frame of a specific one of said upper layers into channels of said lower layer and vice versa, a cyclic redundancy check function, a function of detecting an error of a medium access control sub-layer frame, and a rate adaptation function of adjusting a number of bits suitably for a radio frame, and

wherein said associated functions include at least one of a synchronization information control function, a system information control function, lower channel activation/deactivation functions, quality monitoring and reporting functions of, for maintenance of traffic channel quality, supporting power control, triggering a handover or reporting a channel condition upon traffic channel allocation, and a multi-bearer sequencing function of sequencing a multi-code].

2. (Twice Amended) The [A] communication system as set forth in claim 1, [which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising: a medium access control sub-layer; upper layers of said medium access control sub-layer; and a lower layer of said medium access control sub-layer, wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or said lower layer in response to requests therefrom, and] wherein said basic functions include at least one of:

- a random access control information transfer function,
- a control information transfer function,
- a user information transfer function,
- framing/deframing functions,
- segmentation/reassembly functions,
- functions of dividing a frame of a specific one of said upper layers into channels of said lower layer and vice versa,
- a cyclic redundancy check function,
- a function of detecting an error of a medium access control sub-layer frame, and
- a rate adaptation function of adjusting a number of bits suitably for a radio frame.

3. (Twice Amended) The [A] communication system as set forth in claim 1, [which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising: a medium access control sub-layer; upper layers of said medium access control sub-layer; and a lower layer of said medium access control sub-layer, wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or said lower layer in response to requests therefrom, and] wherein said associated functions include at least one of:

a synchronization information control function;
a system information control function,
lower channel activation/deactivation functions,
quality monitoring and reporting functions of, for maintenance of traffic channel quality, supporting power control, triggering a handover or reporting a channel condition upon traffic channel allocation, and
a multi-bearer sequencing function of sequencing a multi-code.

8. (Twice Amended) The [A] communication system as set forth in claim 1, [which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising: a medium access control sub-layer; upper layers of said medium access control sub-layer; and a lower layer of said medium access control sub-layer, wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or said lower layer in response to requests therefrom,] wherein said medium access control sub-layer includes:

first channel control means for transferring information for synchronization between an originating end and a terminating end, setting a stand alone dedicated control channel between said originating end and said terminating end and performing a cell setting operation between said originating end and said terminating end using the set control channel; and

second channel control means for providing a connection-oriented point-to-point service to an upper layer of said first channel control means and monitoring a quality of a radio link formed between said originating end and said terminating end.

15. (Twice Amended) The [A] signal processing method as set forth in claim 14, [of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and] further comprising: performing a random access control operation between said corresponding mobile terminal and said base station, said step of performing said random access control operation including:

sending a radio resource request message from said corresponding mobile terminal to said base station if said random access control operation between said corresponding mobile terminal and said base station is requested;

sending a radio resource request acknowledge message from said base station to said corresponding mobile terminal;

sending a radio resource response message from said base station to said corresponding mobile terminal; and

transferring a radio resource response reception message to a specific one of said upper layers of said corresponding mobile terminal.

16. (Twice Amended) The [A] signal processing method as set forth in claim 14, [of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and] further comprising: performing a lower channel activation or deactivation control operation of said corresponding mobile terminal or base station, said step of performing said lower channel activation or deactivation control operation including:

transferring a communication path activation or deactivation request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said lower channel activation or deactivation control operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to activate or deactivate a communication path in response to said communication path activation or deactivation request message from said specific upper layer; and

allowing said lower layer to transfer the activated or deactivated result to said specific upper layer.

18. (Twice Amended) The [A] signal processing method as set forth in claim 14, [of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said

base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and] further comprising: performing a control information/user information request operation of said corresponding mobile terminal or base station, said step of performing said control information/user information request operating including:

 sending a control information/user information request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said base station or corresponding mobile terminal if control information and user information are requested by said specific upper layer of said corresponding mobile terminal or base station.

23. (Twice Amended) The [A] signal processing method as set forth in claim 14, [of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

 performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,] wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent, and

 wherein each of said medium access control sub-layers includes:

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a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station.

24. (Amended) A [The signal processing] method [as set forth in Claim 23] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

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wherein said channel request acknowledge message has a data frame including an address field region, a reserved region, a medium access control frame type region and a cyclic redundancy check region for detection of a frame error.

25. (Amended) A [The signal processing] method [as set forth in Claim 23] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel response message has a data frame including an address field region, a reserved region, a medium access control frame type region, a cyclic redundancy check region for detection of a frame error, an information region, a padding region and an end of field region.

26. (Amended) A [The signal processing] method [as set forth in Claim 23] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein said channel request message has a data frame including an address field region, a reserved region, a medium access control frame type region, a cyclic redundancy check region for detection of a frame error, a paging slot number region and a paging channel number region.

27. (Amended) A [The signal processing] method [as set forth in Claim 23] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent,

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station, and

wherein each of said channel request acknowledge message, channel response message and channel request message has a data frame including an address field region, a reserved region and a medium access control frame type region.

28. (Amended) A method of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

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performing, in [wherein] each of said medium access control sub-layers [is configured to selectively perform], an initialization mode [step], an idle mode [step] and a radio resource allocation mode [step] in response to requests from upper layers thereof, said initialization mode including:

scanning a synchronization channel in a corresponding one of said mobile terminals upon powering said corresponding mobile terminal;

determining whether valid synchronization information is received in said corresponding mobile terminal; and

proceeding to said idle mode if no valid synchronization information is received in said corresponding mobile terminal and transferring system time information and base station identification information included in said valid synchronization information to a lower layer of said corresponding mobile terminal if said valid synchronization information is received in said corresponding mobile terminal.

30. (Amended) A [The communication protocol operating] method [as set forth in claim 28] of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, wherein said idle mode [step] comprises [the steps of]:

receiving system information periodically broadcasted by said base station;

comparing an identification number of the received system information with a system information identification number stored in a corresponding one of said mobile terminals; and

updating the current system information of said corresponding mobile terminal if the received system information is newly modified system information as a result of the compared result.

32. (Amended) A [The communication protocol operating] method [as set forth in claim 28] of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, wherein said radio resource allocation mode [step] comprises [the steps of]:

sending a channel request message from a corresponding one of said mobile terminals to said base station upon receiving a random access request message from a specific one of said upper layers of said corresponding mobile terminal;

recognizing that a radio resource allocation operation has been completed, upon receiving a channel response message from said base station, and then proceeding to an activate wait state;

transferring a radio resource allocation request message to a lower layer of said corresponding mobile terminal; and

informing said specific upper layer that a radio resource has been set, upon receiving a radio resource activation response message from said lower layer.

33. (Amended) A [The communication protocol operating] method [as set forth in claim 28] of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system, said medium access control sub-layers being provided respectively in said base station and mobile terminals, said method comprising:

performing, in each of said medium access control sub-layers, an initialization mode, an idle mode and a radio resource allocation mode in response to requests from upper layers thereof, wherein said radio resource allocation mode [step] comprises [the steps of]:

allocating a radio resource requested by a specific one of said mobile terminals, upon receiving a channel request message from said specific mobile terminal, and then sending a channel response message including allocated frequency information and channel allocation description information from said base station to said specific mobile terminal; and

transferring information regarding the allocated radio resource to a lower layer of said base station to activate said lower layer.